The Utility of ChatGPT as an Example of Large Language Models in Healthcare Education, Research and Practice: Systematic Review on the Future Perspectives and Potential Limitations

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Abstract

An artificial intelligence (AI)-based conversational large language model (LLM) was launched in November 2022 namely, ChatGPT. Despite the wide array of potential applications of LLMs in healthcare education, research and practice, several valid concerns were raised. The current systematic review aimed to investigate the possible utility of ChatGPT and to highlight its limitations in healthcare education, research and practice. Using the PRIMSA guidelines, a systematic search was conducted to retrieve English records in PubMed/MEDLINE and Google Scholar under the term ChatGPT. Eligibility criteria included the published research or preprints of any type that discussed ChatGPT in the context of healthcare education, research and practice. A total of 280 records were identified, and following full screening, a total of 60 records were eligible for inclusion. Benefits/applications of ChatGPT were cited in 51/60 (85.0%) records with the most common being the utility in scientific writing followed by benefits in healthcare research (efficient analysis of massive datasets, code generation and rapid concise literature reviews besides utility in drug discovery and development). Benefits in healthcare practice included cost saving, documentation, personalized medicine and improved health literacy. Concerns/possible risks of ChatGPT use were expressed in 58/60 (96.7%) records with the most common being the ethical issues including the risk of bias, plagiarism, copyright issues, transparency issues, legal issues, lack of originality, incorrect responses, limited knowledge, and inaccurate citations. Despite the promising applications of ChatGPT which can result in paradigm shifts in healthcare education, research and practice, the embrace of this application should be done with extreme caution. Specific applications of ChatGPT in health education include the promising utility in personalized learning tools and shift towards more focus on critical thinking and problem-based learning. In healthcare practice, ChatGPT can be valuable for streamlining the workflow and refining personalized medicine. Saving time for the focus on experimental design and enhancing research equity and versatility are the benefits in scientific research. Regarding authorship in scientific articles, as it currently stands, ChatGPT does not qualify to be listed as an author unless the ICMJE/COPE guidelines are revised and amended. An initiative involving all stakeholders involved in healthcare education, research and practice is urgently needed to set a code of ethics and conduct on the responsible practices involving ChatGPT among other LLMs.